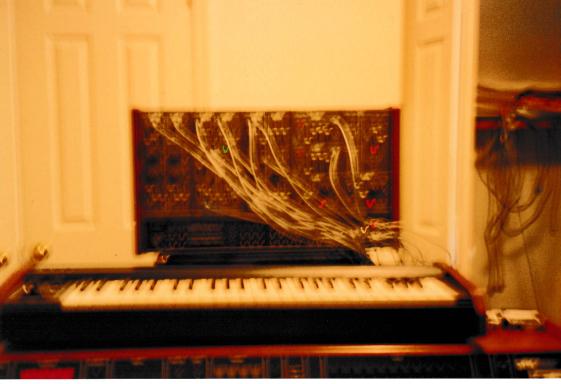








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Where can I find a book on how to write music manuscript? — David 1983, and for \$3.00 starting next year. Other issues of The American Olivares, Dallas, TX.

I'm a professional keyboard player who'd like to become a piano teacher. Are there any books that can advise me on how to get started? Aldo Cavalli, Hackensack, NJ.

I'd like to learn more about the basics of synthesis and the products that are on the market. Can you recommend any books that can help answer my questions? - Matthew Mintz, Potomac, MD.

These are three of the most frequently asked questions when the subject of music books comes up. It's not always easy to find books that relate to your musical needs, but there are several on these topics that can prove helpful. For writing music notation, the standard reference is Gardner Read's Music Notation (Taplinger), which spells out just about every rule you'd ever want to know on this subject. It's available in both paperback and hardback. You can also try Anthony Donato's Preparing Music Manuscript (Amsco, dist. by Music Sales Corp.), which covers a lot of ground, from basic illustrations of repeat signs to discussions on how to prepare choral arrangements. Donato doesn't go into a lot of detail in any one area, but he does provide a thorough overview. If you're more interested in the calligraphy of handwritten notation, check out How To Write Music Manuscript, by Harold Johnson (Carl Fischer), which focusses almost exclusively on how to handle the flat-nib pens used by music scribes. For prospective piano teachers, we can recommend James Bastien's How To Teach Piano Successfully (published by Neil Kjos, 4382 Jutland Dr., San Diego, CA 92117), a very comprehensive paperback. Bastien devotes nearly 600 pages to general considerations, approaches to private teaching, business practice, various pedagogical techniques for different age groups, ways of keeping abreast of new repertoire, and many other areas of interest. There is also a long section of recommended music. Briefer than the Bastien book at about 140 pages in paperback, but also rich with recommended repertoire and generally quite helpful, is The Piano Teacher's Art, by Isabelle Yalkovsky Byman (Kenyon, dist. by G. Schirmer). Synthesizer books are a little trickier. The technology is changing so rapidly that these introductory volumes go out of date with alarming speed. In all honesty, and with minimal horn-blowing, our best recommendation is to read Dominic Milano's Basic Synthesis column, which began in the August '83 issue of Keyboard. Among synth books, one of the most up-to-date and helpful on the market today is David Crombie's The Complete Synthesizer (Omnibus, dist. by Music Sales), which was reviewed in our September '83 Books column. For a comprehensive discussion of analog synthesis techniques, an excellent source is Allen Strange's Electronic Music (Wm. C. Brown Co.). Check with your local bookstore for current prices. And happy reading!

I recently acquired an old pipe organ that had been removed from a church. It was built by a small firm that has since gone out of business. Although the instrument is in pretty good shape, it does need some repair work. Will I have trouble finding the parts I'll need for it? — Bill Pierce, Warrenton, VA.

Probably not. In recent years lovers of historical organs have been stepping up their efforts to rescue the old instruments from deterioration and restore them to operating condition. Their activities have in turn stimulated the parts supply business. Today many organ technicians build their own parts, or know where to go to find them. If you're not a qualified technician yourself, we'd advise you to get in touch with one near you, and have him or her determine what work needs to be done. The two of you can then locate whatever parts you need together. To find nearby technicians or suppliers, you can turn to several sources. First, contact the American Guild Of Organists (815 Second Ave., Suite 218, New York, NY 10017; 212-687-9188) and request a copy of the January '83 issue of their magazine, The American Organist, in which names and addresses of technicians throughout the country have been compiled; the issue is available for \$2.00 through

Organist regularly feature ads placed by technicians and parts supply services. You can get in touch with the Associated Pipe Organ Builders Of America (c/o Visser-Rowland Associates, 2033 Johanna B, Houston, TX 77055; 713-688-7346), an organization of organ manufacturing firms dedicated to monitoring technological advances in their field. Then there's the American Institute Of Organ Builders (c/o John B. Vaughan, 611 Fourth Ave., Holdrege, NE 68948), whose membership comprises independent technicians. Finally, the Organ Historical Society (Box 26811, Richmond, VA 23261; 717-872-5190) may be able to help you track down obscure parts through its network of organ enthusiasts.

My Rhodes electric piano has a mellow, velvety tone. How can I adjust the timbre to get a more bell-like, silvery sound? — Attila Kovács, Veszprém, Hungary.

Speaking very generally, the older Rhodes electric pianos tended to have a slightly brighter sound than the newer models. But no matter what year your instrument was produced, there are ways to brighten up its timbre. The most effective adjustment you can make is also the easiest; all you need is a Phillips-head screwdriver. Take off the top of your Rhodes and notice how each tine is mounted to the tone bar rail with two Phillips screws. By loosening one of these screws on each tine whose tone you wish to brighten, you will be able to adjust the vertical location of the end of the tine in front of the magnet, or pickup. The closer you move the tine to the center of the magnet, the more highs it will produce when struck. When the tine is positioned at dead center, you will hardly be able to hear the fundamental of that particular note at all; instead, the third harmonic, or G in relation to C, for instance, will predominate. The ideal setting for you, then, may be to move the tine to slightly above the center of the pickup, which should give you the fundamental plus a lot of highs. There is a second adjustment that may also help. The velocity with which the hammer strikes the tine can have a slight effect on tone color. The faster the neoprene hammer tip hits the tine, the more harmonics you will hear. If you want to speed up the attack, the action will have to be removed from the piano, the key pedestals may have to be modified, and other fairly complex work might have to be done. Obviously you should leave this sort of job to a qualified technician, since significant damage can be done to the action by someone who doesn't know what he or she is doing.

I'm very happy with my new Roland Juno-6 synthesizer, except for one perplexing feature. On certain settings, particularly organ-type sounds, with the filter cutoff set about halfway, the keyboard tracking control at 100%, and HPF at zero, the sound from the lower two octaves is much quieter than the upper three octaves. Is this shortcoming a feature of the VCF? What can I do to keep the left hand from being drowned out by the right? — Robert Ashmore, Welwyn Garden City, England.

According to Jim Mothersbaugh, head of engineering for Roland's American division, there is no problem with your VCF. He advises moving the keyboard follow control on the VCF down to about 71/2, because that's the point at which the filter will best track with the keyboard. After doing this, you may want to compensate by opening up the filter cutoff frequency a bit, which will have the effect of bringing the treble notes back up to the brightness they were at before, while making the bass notes brighter than they were. When the keyboard tracking is set to its maximum value, the filter cutoff frequency opens up with a greater than unity gain, which has the effect of muting the bass notes. The easiest way to check the tracking value is to put the filter into oscillation and see how it does octaves. If an octave played on the keyboard with an oscillating filter sounds an interval greater than an octave, the keyboard tracking control is at greater than

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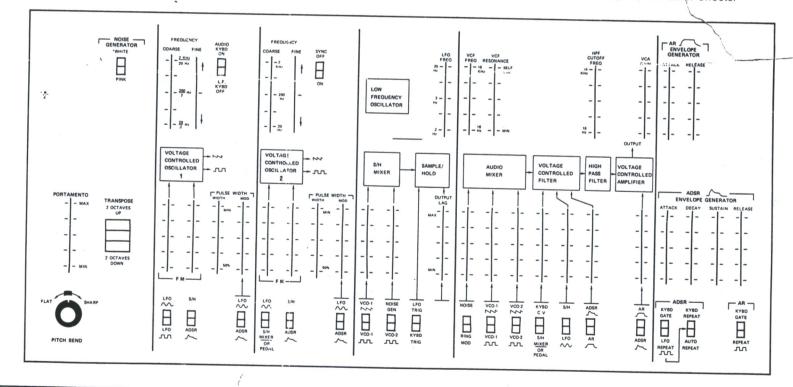
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Voltage Controlled Oscillator II—Exclusive phase-looked synchronization feature. Pulse-width modulated output. Sawtooth, square, and pulse waves.

Low Frequency Oscillator—Sine and square waves, enabling you to create vibrato, repeat, and other effects.



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prophet vs analog/digital synthesizer

S URE, IT'S A RADICAL NEW APPROACH to synthesis. But does it sound good? Yes, it sounds good. It sounds very, very good. If Sequential's new Prophet VS sells as well as it sounds, it's going to be the success story of

"Radical" isn't a word that we would use lightly. Over the years it has become clear that new ideas in synthesis are few and far between. We've seen plenty of development in the area of performance controllers and convenience features-touch-sensitive keyboards, arpeggiators, expandable patch memory, MIDI, and so on. But most often, these seem to get pasted onto the outside of a synthesizer voice that looks suspiciously like a Minimoog: a couple of oscillators, a lowpass filter, a VCA, an LFO, and a couple of envelope generators.

PPG and Korg made a significant improvement by replacing the analog saw/triangle/ pulse oscillators with digital oscillators with a choice of waveforms. The digital waveforms can have lots of interesting overtones, and dozens or hundreds of them may be available on a single instrument. But for dynamic waveshaping, PPG and Korg still rely on the analog lowpass filter (along with auxiliary techniques such as chorusing and LFO modulation). The oscillators themselves produce static sounds.

The breakthrough represented by the Prophet VS does not, we hasten to point out, involve dynamic waveshaping in the digital domain. The oscillators themselves are still putting out static waveforms. The difference is that the VS gives you four oscillators per voice, each with its own choice of wavetables, and lets you control the mix of the oscillators dynamically from a unique twodimensional envelope. A simple enough concept, right? But it turns out to be unexpectedly powerful in creating warm, timbrally subtle and complex sounds. It's not overstating the case to say that the VS may be the first instrument to offer an effective and affordable alternative to the dynamic digital waveshaping of Yamaha's FM keyboards.

In addition to the new synthesis technique, which Sequential calls Vector Synthesis (hence the initials), the Prophet VS has a full array of performance features, including split and double modes and a multi-function arpeggiator, as well as a couple of design innovations that are both amazing and fun. Want to know more? That's what we're here

Vector Synthesis. The concept of vector synthesis is simple but powerful. Basically, the VS has four digital oscillators per voice. These are completely independent as to waveform; 127 waveforms reside in memory at a time. In addition to being mixed in any proportions, the oscillators can be individually detuned relative to one another, and

Keyboard Report excellent and (I has a hard road case), for 1500,5 Prophet VS

> can be individually modulated by LFOs and so on.

But that's just the beginning. The real power of the instrument is that oscillator mix can be dynamically controlled from a number of modulation sources. Primary among these is the mix envelope, which is separate from the filter envelope. The idea of adjusting the relative levels of four different audio sources from a single envelope shape is a bit difficult to grasp at first, but the system Sequential came up with is both elegant and easy to work with.

Here's how it works: The four oscillators, called A, B, C, and D, can be thought of as the four corners of a diagonal square. The mixer envelope has rate settings just like a normal envelope, but in place of level settings, it has a series of points which can fall anywhere within this square. Thus it is a twodimensional envelope. The points of the envelope are defined by vectors with both X and Y coordinates (hence the name). The points are set by moving the joystick, and the current setting is displayed in the LCD window. The output levels of the four oscillators stick is in the center of its range, the values are A25, B25, C25, D25. Jam the stick over to the right corner and the values change to A0, B0, C100, D0. Intermediate positions create some combination of values. The only limitation of this system is that

always add up to 100%; thus when the joy-

you can't mix two waveforms that are at opposite corners of the square without also including the remaining two waveforms. In order to do this, you have to switch the positions of two of the waves so that the two you want to mix are side by side. This takes less than ten seconds, so it's no big deal.

The process of defining a timbre envelope may sound a bit arcane, and indeed it could take a while to learn exactly what this machine is capable of, but the results are instantly audible and thoroughly satisfying right from the start. You can pick any four waveforms and set up any slow, smooth mix envelope, and it will sound great. The timbral activity is rich and pleasing, because the harmonic spectrum is constantly changing, in subtle or obvious ways, entirely independent of the shaping provided by the lowpass filter.

Waveforms. The Prophet VS stores 127 different waveforms in memory at a time. Of these, 95 are permanent (ROM), while the remaining 32 are user-programmable (RAM). There are two ways of creating new waveforms: by combining existing waveforms and by loading data from a sampler via MIDI. You could probably play and program the instrument happily for years without ever worrying about waveform creation, as the existing waveforms offer lots of variety. It's wonderful to see this level of creative flexibility being put into the hands of the musician however.

The factory waveforms include some old favorites, such as sawtooth, square, thir pulse, and sine. Some others we recognized as derived from pipe organ concepts, with specific sine overtones mixed in an additive manner. But the only theoretical limits fo the user waveforms are the limits of wave table resolution itself. We did notice that the "sine" wave had some audible high harmon ics in it, presumably due to the limitations c wavetable size, but this isn't necessarily bac In fact, it's good. Why? Normally, a digital oscillator has a lowpass filter at its output t smooth the steps of the quantized wave Since the VS has a lowpass filter associate

Prophet VS

Keyboard: 5 octaves, C to C, unweighted. Velocity and monophonic pressure.

Voices: 8-voice polyphony. Four digital oscillators, three five-stage envelope generators, analog lowpass filter, and two LFOs per voice.

Memory: 100 user patches. 127 waveforms (32 user-programmable). Cartridge port for 100 additional patches. Arpeggiator holds 61 or 122 notes (depending on mode), including velocity values.

Interfacing: MIDI in, out, and switchable out/ thru. Stereo audio outs double as mono out and headphone out. Footswitch ins for release pedal and arpeggiator pedal

Features: Envelope-controlled and joystickcontrolled waveform mixing, eight-character patch names, keyboard split and double modes, built-in stereo chorus, stereo panning and individual voice positioning. Multifunction arpeggiator can be synced to MIDI clock. Wavetable loading from external data source.

Dimensions: 38" x 151/2" x 41/2". 36 lbs.

List Price: \$2,599.00.

Contact: Sequential, 3051 N. First St., San Jose, CA 95134. (408) 946-5240.

with the voice, no filter was put on the oscillators themselves, thus giving you the maximum number of clean high harmonics. If you want a sine wave with no harmonics, just use the lowpass filter on the voice.

For you techies, each wave is stored as a set of 128 12-bit words. If you're used to building megabyte sonorities on a mainframe computer this may not seem like much, but for practical musical purposes at an affordable price, it's a fantastic amount of

timbre storage.

In creating a waveform of your own, you can combine any four of the existing waveforms, tuning each of them anywhere among the first 32 harmonics and mixing them in any proportions you like. If you like adding sine waves, you could create a wave by adding four sine waves at different harmonics, store this wave, and then recall it as a unit to mix with three more sine waves, and so on. You do reach a point of diminishing returns with this process. Adding non-sine waveforms and tuning them to non-octave overtones seems to produce foldover; that is, because of the mathematics involved, you don't get a higher and higher sound. You just get a sound that has different partials in it. Still, you can build lots of different waveforms with this system, and it's very easy to use.

If you'd rather, you can load waveforms from an external sampling machine, using the proposed MIDI sample dump protocol. To do this, you must truncate the sample to exactly 128 12-bit words. If you've got your sampler hooked to a computer with good sound editing software, this should pose no problems. Those of you who are not familiar with this type of technology should understand that the 128-word limit is too short to allow you to play anything resembling an actual sampled sound from the VS. All you can do is pull out, for example, a single cycle of a bassoon waveform and transfer that to the synthesizer. The synthesizer will still have to provide the attack transients, dynamic shaping, and so on. This might turn out to be a potent source of new waveforms, but it's certainly not necessary to use this capability to enjoy playing the VS.

Synthesizer Voice. While the voice on the VS doesn't have guite the conceptual complexity of the Oberheim Xpander, it has a few new wrinkles that give it plenty of musical power. There are four digital oscillators per voice, as already mentioned, and these can be detuned from one another and modulated independently from various sources. including key pressure and the filter envelope. Each voice has three envelope generators, one each for oscillator mix, filter cutoff, and overall amplitude. These are not simple ADSR envelopes, either; more on that below. Each voice has two LFOs, and these can modulate one another's rate and depth if desired. The filter is of the standard analog

The modulation matrix has seven possible sources and 15 possible destinations. Sources include key pressure (monophonic), key velocity, key position, filter envelope, moduiation wheel, and the two LFOs. Destinations include the frequencies of the four oscillators, filter cutoff, oscillator mix along two separate axes (A-C mix and B-D mix), rate

lowpass resonant type.

and amount for both LFOs, amplitude envelope, voice panning, and chorus rate and depth.

There are two limitations built into this matrix. First, not all sources can be routed to all destinations. Key pressure can be routed anywhere, but the modulation wheel can only control the amount of the two LFOs and the chorus depth. And second, each source can have only one amount. That is, for a given patch, the pressure amount might be +68, and this same pressure response will be routed to all the destinations for which pressure is switched on. (A single destination can be switched on for some sources and off for others.)

We might agree or disagree with Sequential's choices for certain specific features of this matrix. It's great to see both positive and negative modulation amounts for many of the parameters, but on the other hand, it would have been nice to see a MIDI controller input added. And the mod wheel certainly ought to be able to control LFO rate as well as LFO amount. In general, though, the system seems both flexible and eminently useful for generating expressive effects.

The envelope generators on the VS are an adaptation of a concept that we first encountered on the Buchla 400 (see Keyboard Report, July '83). We're surprised that nobody else has yet picked up on the idea, as it seems a natural. In a word, the envelopes loop. Instead of being stuck with a static sustain level, you can set up a sustain loop in which the envelope will cycle between points 2 and 3, points 1 and 3, or points 0 and 3. It will loop either forward-only or forward-and-backward, and the loop can be set to repeat from one to seven times, or continuously until the key is lifted. We would have liked to see envelopes with a specific number of repetitions continue to cycle after key-up rather than jumping to the release segment, as it is a bit disconcerting to hear a timbre loop stop when you lift the key. But you can't have everything. The loops in their current version are very useful.

Even without the loops, the envelopes are a bit more complex than those on a DX7. They have five points, numbered 0 through 4. With the amplitude envelope, point 4 must have a level of 0. In the absence of a loop, point 3 is the sustain point. There is no rate 0, obviously, as the envelope starts instantly at point 0. In addition, one excellent feature of the Prophet-T8 has been retained: Each envelope has two rate 4 settings, one for when the sustain pedal is down and the other for when it is up. Normally, this "alternate release" rate will be longer than the regular release, mimicking a piano's sustain pedal response, but with layered voices it might be useful to program one voice to have a long release when the pedal is down and the other when the pedal is up.

The two LFOs have a choice of triangle, square, up sawtooth, down sawtooth, and random waveshapes. Frequency can be varied from about .15Hz to about 25Hz. As already mentioned, each LFO can modulate the other's rate and depth. We found that the maximum effect that this modulation could have was somewhat less than we might have

liked, but unless you're a dedicated avantgardist, you'll probably appreciate having nice subtle control over small changes in vibrato, which is the basic application of this type of modulation.

An instrument with this much in the way of timbral resources probably doesn't need a built-in chorus, but it's got two. Chorusing can be switched on separately for the left and right output channels, and the rate and depth are separately programmable for each patch. Stereo panning is also included, and stereo location can be controlled from such sources as the LFOs (great for swirling effects) and the keyboard. Each voice is panned separately, and each can have its own starting location in the stereo field, so all kinds of stereo effects are possible.

As it happened, the unit we received for review had what we suspect was a bad voice controller card. Whatever the cause may have been, the result was that now and again a note would fail to turn off, just as if a MIDI message had been interrupted. We assume that this was no more than an isolated prob-

lem with a bad component.

Performance Features. Some of the performance-oriented features on the VS are pretty standard, but a couple of them definitely go that extra mile. The five-octave keyboard, with velocity and monophonic pressure sensing, is real standard, as are the pitch-bend and mod wheels. Pitch-bend amount is programmable, but globally, not separately for individual patches. Maximum bend range is a fifth in each direction.

The keyboard split and layer functions are basically familiar as well. One new feature is a delay setting, in which the second voice in a layer can follow the first by up to half a second. The second voice can be detuned as well. By nudging these two parameters around, you should be able to get some wonderful fat sounds. Each voice has the number of a second "link voice" stored with it, along with whether the link is a split or a layer, the location of the split point, and the delay and detune settings. All this data is remembered even when split and layer are turned off.

The arpeggiator on the VS has more features, and is more fun to play with, than any other arpeggiator we've ever seen. For some types of electronic trance music, it could easily be used interactively in a concert situation. It can operate in a number of modes, can sync to MIDI clock at lots of different rates, can run two separate arpeggios with different numbers of notes simultaneously (!), can play arpeggios with rests, and can be latched and used as an accompaniment while playing a live solo. In this last mode, the pitch-bend wheel affects only the live solo

voices, not the arpeggiation.

Arpeggio scanning can occur in up, down, up/down, assignable, reverse assign, or random order. When using assign mode, the memory can store more than a hundred notes. Transposition of latched arpeggios is also implemented, with or without a footpedal. The last arpeggio you played is remembered when the arpeggiator is switched off, and can be restarted by pushing a single button. You can choose whether or not key velocity will be stored and played back as part of an arpeggio. Continued

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PROPHET VS

Even more impressive is the fact that arpeggiation parameters are stored separately for each patch. This lets you set up specific performance applications ahead of time, which with an arpeggiator this complicated is virtually a must. We were also pleased to see that most parameters of a sound can be edited live while the arpeggiator is running, without causing any clock hiccup problems. In fact, we had so much fun with the arpeggiator that we almost couldn't stop long enough to write this review.

And as if that weren't enough, there's the joystick. The waveform mix joystick is active during live playing; it has the effect of pushing and pulling the waveform envelope in one direction or another. Once this envelope has reached a sustain point or loop, sweeping the joystick around its circumference will give you a spectacular blending of tone colors. Each new note that you play, however, will ignore the current position of the joystick if the joystick is stationary. Using this device effectively in performance will probably take some practice, but the results should be worth it.

Two footswitch inputs are furnished on the unit, one for switching on the alternate release segments of the envelopes and the other for latching the arpeggiator.

Editing Controls. Lest you think this review is a shameless rave-up, let's cover some minor gripes in the patch editing department before we get to the good stuff. A data entry slider is used on the VS for editing all parameters except waveform mix; the latter is controlled from the joystick. One of the annoyances we encountered was the absence of single step increment/decrement switches. It's a bit tricky at times to nudge the slider just far enough to get a value to jump by a single digit, and with parameters like waveform number, a single digit can have a huge effect.

When moved, the slider jumps instantly from the value stored in memory to the current position value. We still prefer the idea of adding to or subtracting from the value in memory based on movement up or down from the current position, but nobody seems to be designing instruments this way any more, so we probably shouldn't even mention it. You may find yourself jumping a foot when you go to edit filter resonance and squealing oscillation blasts out of the speaker at you, but most of the time the change is less audible, or at any rate less distressing.

Many operations are accessed by stepping through a menu of choices with a single button prior to using the slider. If you go past the choice you want, you may have to step through eight or ten other choices to get back to it, as there is no way to reverse direction. Here again, the editing interface is not ideal, but the LCD display always shows you clearly where you are, and some people may prefer this system to, for example, Korg's parameter number arrangement. At least on the VS, a single panel button is always used for a small and well-defined set of operations.

The method used to decide whether or not you want to store the patch you're cur-

rently developing is significantly better than the standard edit/compare button. The VS has a "review" button. When you hit this, the patch you're working on is temporarily frozen in the edit buffer, and you can then use the program recall buttons to call up any other program you want, until you find one that you're willing to trash. This is one of those small but significant improvements that ought to become standard on other instruments.

Initialize functions are included for both an init voice and an init waveform—a thoughtful touch. But wait! There's more! The VS has a random patch generator builtin. If you find yourself coming up with the same old patches whenever you start from the init voice, you'll appreciate the random patches, which are definitely not bland. Many of them are outrageously discordant, but some are quite ethereal. Avant-gardists may want to load up the memory with a hundred random patches prior to a concert. For the rest of us, editing a random patch into something resembling musical normalcy could be a way of learning the resources of the instrument while coming up with some startling new sounds.

MIDI Implementation. As already mentioned, the VS arpeggiator can by synced to incoming MIDI clocks. Clock events per arpeggiator note can be adjusted to any value from 2 to 24 (from 32nd-note triplets to quarter-notes). Programs and wave data can be loaded and stored to computer via MIDI, and individual waveforms can be loaded.

Some of the options are a bit more esoteric. Notes played by the arpeggiator can be sent over a different MIDI channel from the channel the keyboard is sending on. An overflow mode allows the first eight notes played on the keyboard to be played only internally, while any excess notes are sent out via MIDI. When slaving one VS to another, joystick position can be transmitted and received. Data entry slider movement and parameter number are also sent and received. Generally, you can select "disabled," "transmit only," "receive only," or "transmit and receive" for all of these options.

Conclusions. From the moment we turned the Prophet VS on, it was apparent that Sequential has a winner on their hands. The factory presets sound wonderful, and many of them have a distinctive character that differs in subtle ways from anything we've heard before. Programmers will have a field day exploring the new possibilities of looping envelopes and waveform mix modulation. The generous 100-patch memory (with 100 more on a plug-in cartridge) will come in handy in performance, as will the waveform joystick and the extensive MIDI implementation. The on-board stereo panning effects are sure to be welcomed by stadium performers in search of a big sound, while the random patch generator will be a serious boon to fringe music types. While we had a couple of minor reservations (don't we always?) about the design of the user interface, we hope nobody will pass the instrument by on that account. There are a lot of fine synthesizers out there these days, but Vector Synthesis really does put the VS in a class by itself.

SUPER JUPITER MKS-80 POLYPHONIC SYNTHESIZER MODULE

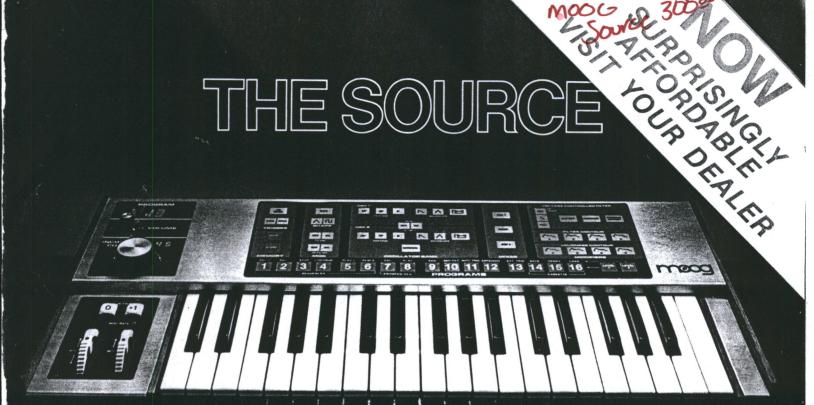


A Synthesizer Module offering the Legendary "JUPITER" Sounds

- ●Extremely warm, thick sounds produced by sixteen VCO's, eight VCF's, eight VCA's, and sixteen ENV's

 Velocity- and pressure-responsive
- ●Sixty-four tones and sixty-four patches in internal memory ●128 tones and 128 patches in M-64C memory cartridge
- •Dimensions: 482 (W) × 410 (D) × 90 (H) mm (19" × 16-1/8" × 3-9/16"), EIA-2U •Weight: 8 kg (17 lb. 10 oz.)

THE SOURCE



The Source.

The Controls.

16 programmable voices.

Touch panel for digital precision.

Instant editing and program storage.

Pitch and Modulation wheels.

Rear panel tuning and interface connections.

The Sound.

Dual oscillators.

Dual 4-part contours.

Moog® filter, Moog sound.

Noise generator.

Single/multiple triggers.





Our programmed memory chip linked with its Z-80 microprocessor.

The Features.

Two real-time 88-note sequencers.

24-note programmable arpeggiator.

Digital sample & hold.

Programmable sequencing of voice changes.

Program storage on standard cassette.

The Source.

The definitive monophonic synthesizer from Moog.



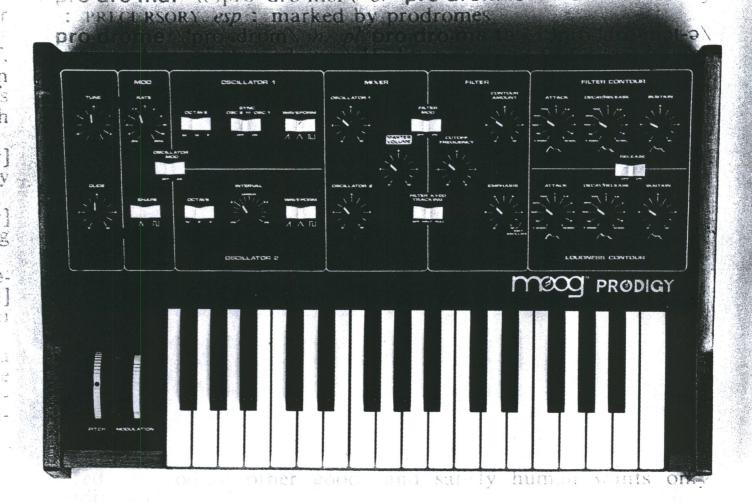
See your authorized dealer or write for details.

2500 Walden Avenue, Buffalo, New York 14225 Moog Music, c/o Waalhaven Z.Z. 48, 3088 H.J., Rotterdam, The Netherlands



The people who started it all.

prod-i-gy \'präd-ə-jē\ n, pl -gies [L prodigium omen, monster, fr. pro-, prod- + -igium (akin to aio I say) — more at ADAGE] 1 a: a portentous event: OMEN b: something extraordinary or inexplicable 2 a: an extraordinary, marvelous, or unusual accomplishment, deed, or event b: a highly talented child pro-dro-mal \(')pro-'dro-mal\() or pro-dro-maic \(\)-'dram-ik\(\) adj



LISTEN. IT LIVES UP TO ITS NAME.

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production control n: systematic planning, coordinating, and directing of all manufacturing activities and influences to insure having goods made on time, of adequate quality, and at reasonable cost:[\$495] moog® 2500 Walden Avenue, Buffalo, New York 14225

ARP 2500 The ARP 2500 has been the industry standard since it was introducted two years ago, and is still years ahead of its time. Completely modular, it offers a ... wide selection of userfilters to the most sophisticated seddencer system ever designed And the multi-voice sespectates can be stacked as synthesizer is human-engineered matrix switch patching and a ande range of compact function

AVAILABLE FUNCTION MODULES

1003 Dual Exponential Envelope Generator

1004p Voltage Controlled

1004t Voltage Controlled Oscillator

1005 Modamp

1006 Filtamo

1016 Dual Noise Random Voltage Generator

1023 Dual Voltage Controlled Oscillator

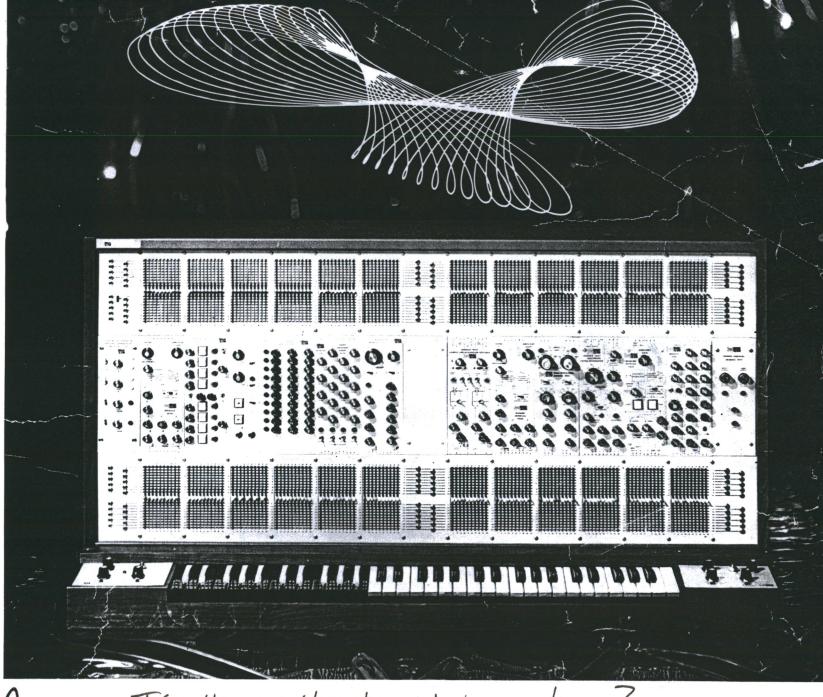
1027 Ten-position Sequencer 1033 Duai Delayed Exponential Env Generator

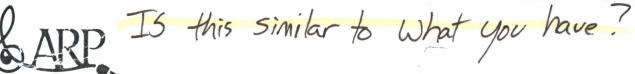
1036 Dual Sample & Hold Random Voltage Generator 1045 Voltage Controlled Voice 1046 Quad Envelope

1047 Multimode

Filte: Resonator

1050 Mix Sequencer Kelyboards: one, two. three, or lour-voice Cabinets: 15-module console, 8-module wing, 8-module portable wing





Thought you might like is! Thought an ARP 2600 is!

he Arp 2600 synthesizer has set a standard against which all synthesizers are measured. No other instrument offers the musician such a balanced combination of studio and live performance options.

Creative artists like Joe Zawinul and Stevie Wonder are just two of the many who have chosen the



2600 as their synthesizer. A major reason for its popularity is its openended flexibility. The 2600 offers an unlimited range of sound production, modification and processing functions. On concert stages, in recording studios and in the music departments of the world's most prestigious colleges and universities, the 2600 synthesizer

performs brilliantly year after year.

A look at the control panel, or "brain" of the 2600, tells you of its awesome musical power. The instrument utilizes the block diagram concept of electronic sound creation similar to that found on Arp's smaller, less complex variable models. Linear sliders and switches are used throughout for ease of programming, and to provide the user with a quick visual record of signal flow.

The 2600 can be operated with or without patchcords. All of the functions are internally wired and can be controlled via sliders and switches. Female panel jacks provide access to every function on the 2600, so that you may override any prewired internal connection. This gives you complete control of the synthesizer process, allowing you to choose the raw signal, then determine the exact sequence of modification and control required to create just the sound or effect you desire.

New keyboard electronics have recently been added to the 2600 to expand its live performance capability. A compact panel to the left of the keyboard offers two-voice dual memory, a low frequency oscillator for trills and vibrato, single/multiple trigger selection, vibrato depth and delay controls, portamento, pitch bend and an interval latching device that lets you memorize, delete and call back selected intervals using a footswitch controller.

Through Arp systems inter-

ARP2600

facing, the 2600 may also be interconnected with other Arp synthesizers. Headphone jacks, monitor speakers and built-in reverb are also included.

The 2600 has been carefully designed for the discerning professional musician, whether composer, performer, creative audiophile. teacher, student or combination of all. Several books and performance aids are available to further enhance the enjoyment of 2600 ownership. The 2600 Owner's Manual is a text used for electronic music courses in addition to its use as a practical operational guide. The 2600 Patch Book is the collected wisdom of dozens of 2600 owners, featuring 100 control settings for basic and advanced synthesizer patches.

Complete with owner's manual, integrated travelling case, interval latch foot switch and patch cords, the Arp 2600 will provide you with years of exciting musical rewards.

1. VCO 1, 2, 3: Create raw pitch. Sawtooth (brassy), square (hollow), pulse (reedy), triangle (mellow) and sine (very mellow) waves available. Pitch control sliders include: vibrato, trill, sample/hold and ADSR control. All oscillators can double as controllers via AUDIO/LF switch. Pulse width modulation (available on VCO 2) can produce saxophone sounds, dynamic brass ensemble effects and other heavy synthesizer sounds.

2. VCF: Changes timbre by adding, subtracting or emphasizing harmonics. Various controllers control VCF by keyboard, VCO 2 (Tremolo LFO), ADSR or any other

controller that can be patched into the control input jacks.

3. ADSR/AR: Envelope generators that control every aspect of articulation.

4. VCA: Used as a voltage-controlled volume control. Essential to any patch when the performer desires to have the VCF open in a static mode.

5. Pan: Pan pot locates any two sounds in the stereophonic image.

6. Reverb: Enhances and adds richness and concert-hall depth to a patch.

7. Internal Speaker: Allows low volume monitoring of patch.

8. S/H: Controls VCOs for random computer like sound, or VCF for funky effects. Rate governed by internal clock.

9. Voltage Processors: Functions include sources for positive or negative voltage (changes pitch of VCOs), voltage inverters (invert keyboard, envelopes, etc.). Can be used as audio mixers or attenuators.

10. Noise Generator: Creates sounds of wind, earthquake, surf, steam, bombs, etc.

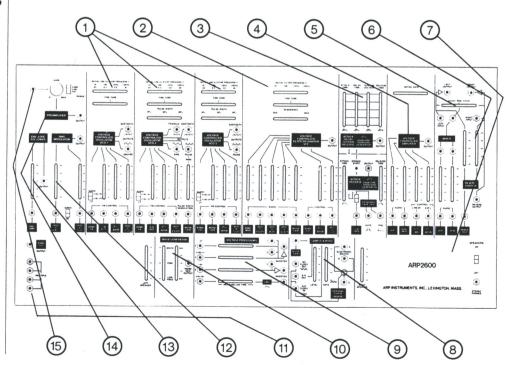
11. Multiple: Splits signals into four outputs.

12. Ring Modulator: Creates gongs, chimes, or special ethereal sounds.

13. Envelope Follower: Used with external input (mic., guitar). Produces a voltage proportionate to the amount of input volume. Good for touch responsive wah-wah.

14. Preamplifier: Boosts low-level external audio signals.

15. Mini "D" Jacks: Allows the performer to override any prepatched effect.





KORG MONOPHONIC SYNTHESIZER MS

A COMPLETELY EQUIPPED MONOPHONIC SYNTHESIZER AT A NEW AFFORDABLE PRICE

The MS-10 gives you all the synthesizer modules you need to create an infinite variety of sounds. And it has a patch panel so you can be in complete control of the territory you explore. Borrowing technology from our complex PS-series units, we developed the amazing MS-10 to make the creative possibilities of the synthesizer available to more musicians. After you master the controls of the MS-10, you'll have no problem interfacing with other synthesizers, sequencers, microprocessors, and external control units. You'll discover that the MS-10 gives you complete freedom to synthesize your own unique sound. There are no limits.

Voltage Controlled Oscillator (VCO)

Choose between four different waveforms and four keyboard ranges: 32', 16', 8', and 4', to determine your basic sound. The OCT/VOLT and FREQ/VOLT input jacks give you external control via another synthesizer or control voltage source. You also have the option of using an external signal for FM (frequency modulation) and PWM (pulse width modulation).

Voltage Controlled Low-Pass Filter (VCF)

Vary the tone color of your basic waveform by shaving off upper harmonics. Emphasize the fc resonance with the Peak knob; turn it all the way up and use the self-oscillation effect as another sound source. As with the VCO, you can use either internal or external control to modulate the cut-off frequency and peak resonance.

Modulation Generator (LFO)

Generates a low-frequency signal used to modulate other modules of the synthesizer. An LED flashes on and off to tell you the frequency. The waveform is continuously variable to give you performance possibilities unavailable with conventional LFO's.

External Signal Input

Connect an electric guitar, microphone, or other input, and use the VCF and VCA to create a synthesized effect.

Envelope Generator (EG)

This module generates a signal used to control the changes in sound over time (attack, decay, release, sustain). Besides the "ADSR" settings, you also have control of hold time.

Patch Panel

Connect modules together with patch cords to bring out the full potential of the synthesizer. The flow chart on the panel makes it easy to set up complex patches.

Control Wheel

Use the control wheel to vary pitch, tone color, and volume while playing the keyboard.

SPECIFICATIONS

(CONTROL SECTION)	
	· •F C 32 KEYS / (2 % OCTAVES)
2 VOLTAGE CONTROLLED	• SCALE (32: 16: 8: 4:)
OSCILLATOR	(5.5 OCTAVES+6 OCTAVES(FM))
O.S. A. F. KIVIII	 WAVE FORM LAND PW PWM_NOISEL (4 MODES)
	●PW ADJUST PWM INTENSITY
	PITCH 11 OCTAVE OR MORE 1
	PORTAMENTO
	• FREQUENCY MODULATION INTENSITY BY MG
	•FREQUENCY MODULATION INTENSITY BY EG EXT
3 VOLTAGE CONTROLLED	• CHI OFF FREQUENCY
LOW PASS FILTER	●PLAK (FLAT SELE OSG)
1.04 10 10 11 11 11	• GUTOFF FREQUENCY MODULATION INTERSITY BY MG
	• CULTOFF FREQUENCY MODULATION INTENSITY BY EG
	171
4 FOVELOPE GENERATOR	· •HOLD TIME
	• ATTACK TIME
	DECAY TIME
	• SUSTAIN LEVEL
	• BLILASE TIME
6 MODULE ATTONCH BUILDING	- • WAVI [] [] []
5 MODOL MION GIAI MATON	• FREQUENCY
6 EXTERNAL INPUT	
	• CONTROL WHEEL (CENTER CLICK STOP)
8 POWER SW & VOLUME	·· •VOLUME
(PATCH PANEL SECTION)	
1 KEYBOARD	* *KEYBOARD CONTROL VOLTAGE OUTDUT

MANUAL CONTROLLER	CONTROL WHEEL (CENTER CLICK STOP)
8 POWER SW & VOLUME	• VOLUME
(PATCH PANEL SECTION)	
1. KEYBOARD	• KEYBOARD CONTROL VOLTAGE OUTPUT
	(EXPONENTIAL) OV - 8V
	●KEYBOARD TRIGGER OUTPUT → GND
2 VC0	······ • VCO CONTROL VOLTAGE INPUT (FREQ. VOLT)
	OV + 8V
	●EXTERNAL FREQUENCY CONTROL INPUT (OCT VOLT)
	3V · 3V
	●EXTERNAL PULSE WIDTH MODULATION INPUT
	5V · 5V
3 VCF	•EXTERNAL SIGNAL INPUT 3Vpp MAX
	 EXTERNAL CUITOFF FREQUENCY CONTROL INPUT (2000L V) 5V → 5V
4 VCA	● INITIAL GAIN CONTROL INPUT OV → 5V
5.16	• EXTERNAL TRIGGER INPUT → 4 GND
	●LINVELOPE SIGNAL REVERSE OUTPUT 5V 15V
6 MG	 TRIANGEL OUTPUT (N ∧ Λ) 5Vpp
	●RECTANGLE OUTPUT (I I I) 05V
7. NOISE GENERATOR ·····	●PINK NOISE OUTPUT 5Vpp
	WHITE NOISE OUTPUT 5Vpp
8. MANUAL CONTROLLER	CONTROL WHEEL OUTPUT 5V OV 5V

POWER CONSUMPTION ----- 5 W

9 SIGNAL OUTPUT

● DIMENSIONS ● 499(W) × 309(D) × 249(H) mm

EIGHT ● 6.3kg

● ACCESSORIES CONNECTING CORD 3m×1

PATCH CORD 35cm×1



· SIGNAL OUTPUT / 2Vpp MAX (OUTPUT IMPEDANCE

M5-20 w/case

UKU IONOPHONIC SYNTHESIZER MS-

EXPANDED HORIZONS WITH A BUILT-IN **XTERNAL SIGNAL PROCESSOR**

ist as the PS-3300 and PS-3100 set new standards for polyphonic nthesizers, the MS-20 leaves other monophonic units by the ayside. You get two VCO's, two VCF's, two VCA's, two EG's. MG (LFO), an S/H circuit, and extra noise generators. Plus, the S-20 has an external signal processor (ESP) that lets you turn it to a guitar synthesizer, drum synthesizer, vocal synthesizer . . . ou name it. This unit does everything you ever hoped for in a nthesizer, and some things you'll have to discover for yourself.

oltage Controlled Oscillator X2

i top of the two complete VCO's, you have both a linear CV int and a nonlinear (1 OCT/V) input for compatibility with any ner synthesizer in the world. There is a noise generator, and a g modulator for percussion effects. Each VCO has an indepennt volume control so you can mix them at will.

Itage Controlled Filter X2

u can use the high-pass and low-pass modules separately, or jether as a band-pass filter. Use external or internal signals to dulate one or both VCF's for a new level of complex music

dulation Generator

3 this low-frequency oscillator (LFO) to modulate other dules of the MS-20. Waveform and frequency are continuously iable to give you a variety of effects impossible with convennal units.

velope Generator 1

ate pitch bends, delayed vibrato, and other modulation effects h this envelope generator. The internal patch connects this EG most modules, but if you use the patch panel, the sky's the

Envelope Generator 2

Control changes in volume and tone color over time (attack, decay, sustain, release) with this envelope generator. Besides the conventional"ADSR" parameters, you also get a HOLD TIME control.

Patch Panel

Bring out the full potential of the MS-20 by using the patch panel. Set up a complex patch by following the flow chart on the panel. Here you'll find VCA, sample and hold, noise generators (pink and white), and other modules.

External Signal Processor (ESP)

This gives you the freedom to use external music signals to actually control synthesizer operation. In other words, if you plug in an electric quitar, you have a quitar synthesizer; plug in a micro phone and you have a vocal synthesizer. The LSP is an interface that converts the pitch, volume, and other parts of the sound into voltages that control the synthesizer modules.

Momentary Switch

This manual switch is conveniently located for easy triggering of pitch bends and other effects while performing.

Control Wheel

For continuously variable control of pitch, tone color, volume, and other effects, while playing the keyboard.

: FI YROARD	
	●C C 37 FEYS (3 OCTAVES)
" VOLTAGE CONTROLLED	● SCALE TR2 TO B 4 T TO UCTAVE STRUCTAVE SULAVESULATED
OSCRIATORI	WAVE FORM IA. D. PWILL ADD WHILE NODE I CA MODE S.
3 VOLTAGE CONTROLLED	• SCALE [16 8 4 2] (6 OCTAVES + 6 OCTAVES (EM))
OSCILLATOR 2	· WAVE FORM [N.A. A . RING MODULATOR] (4 MODES)
4 VC O MASTER CONTROL	MASTER TUNE (OCTAVE OR MORE)
	PORTAMENTO (OCTAVE OR MORE)
	OF BE OUT NOW MODILILATION INTERNAL
	FREQUENCY MODULATION INTENSITY BY MG TEXT
5 V.C O MIXER	FREQUENCY MODULATION INTENSITY BY EGI EXT
3 V.C O WINEH	
6 VOLTAGE CONTROLLED	● VCO-2 LEVEL
6 VOLTAGE CONTROLLED	• CUTOFF FREQUENCY
HIGH PASS FILTER	PEAK (FLAT SELF OSC)
	CUTOFF FREQUENCY MODULATION INTENSITY BY MG T EXT
AOFINGE COMINOFFED	• CUTOFF FREQUENCY
LOW PASS FILTER	●PEAK (FLAT SELF OSC)
	CUTOFF FREQUENCY MODULATION INTENSITY BY MG T EXT
8 ENVELOPE GENERATOR 1	ODEL AY TIME
	ONTACK TIME
	• RELEASE TIME
	OHOLD UM
	ATTACK TIME
	•DECAY FIME
	• THE TAREFUL VIEL
by Advisory Advisory Construction	• RELEASE TIME
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II MANUAL CONTROLLER	CONTROL WHELE STREETINGS IN THE
	MOMENTARE SWITCH
	VOLUMI
B INDICATOR	PLED [TRIGGER, MG_RATE]
EXTERNAL SIGNAL PROCESSO	P SECTIONS
	AW BE O THAT I TANDE.
	FLOW COT FREODENCY
	FRIGH CUT FREODENCY
	PCA VD ID-1
	FIRM SHOLD LEALT
2 (DECULA OUTFOL)	MITTAL BY CAUTO EAD TACHTM)
•	AMP II II II OH
	MATIN PASS FREEDRIC OUT
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	MILL COLL OF S
	1100, OO1 4 G(4)
3 INDICATOR(LED)	PEAK INDICATOR
	TRIGGER INDICATOR
PATCH PANEL SECTIONS	
	NET AMARINE CONTINUE
a constant	OFF CHONING FOR THE CONTROL FO
_	O NV
	PT (BOARD HUGGER OUTPUT - 4 570)
	VCOT: VCO 2 CONTROL VOLTAGE INPUT (LINEAR RESERVAÇÃO)
	0 .30
3. 1/00	VCO 2 CONTROL VOLTAGE INPUT (LINER RESPONSE) D + 8V
. 41.00	VGO 1 - VGO 2 EXTERNAL FREQUENCY CONTROL INPUT
	(OCT V) 3V : 3V

8 NOISE GENERATOR

9. SAMPLE AND HOLD

11 MANUAL CONTROLLER 12 SIGNAL OUT PHONES OUT ●POWER CONSUMPTION

10 MODULATION VCA

ODIMENSIONS WEIGHT ----
ACCESSORIES EXTERNAL SIGNAL INPUT 3Vpp MAX
 EXTERNAL HP FILTER CUTOFF FREQUENCY
 CONTROL INPUT (2 OCT V) 5V 5V

■EXTERNAL HP FILTER CUTOFF FREQUENCY CONTROL INPUT (20 CT V) 5V V
■EXTERNAL LP FILTER CUTOFF FREQUENCY CONTROL INPUT (20 CT V) 5V V
■TOTAL EXTERNAL MODULATION INPUT (1 EXT) 5V
■TOTAL EXTERNAL MODULATION INPUT (1 EXT) 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL INITIAL GAIN CONTROL INPUT 0 5V • OV
■EXTERNAL EVENT 0 5V • OV
■PINK NOISE OUTPUT 5V • OV
■PINK NOISE OUTPUT 5V • OV
■PINK NOISE OUTPUT 5V • OV
■HILE NOISE OUTPUT 5V • OV

■HILE NOISE OUTPUT 5V • OV

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■HILE

PINK NOISE OUTPUT SYDD
WHITE NOISE OUTPUT SYDD
SCHOOK TRIGGER INPUT SAGN
SAMPLE SIGNAL INPUT SYDD
S'H OUTPUT SYDD
S'H OUTPUT SYDD
S'H OUTPUT SYDD
S'HOUTPUT SYDD
SGRAAL INPUT 5V 5V
SIGNAL INPUT SV 5V
SIGNAL INPUT SV 5V
MOMENTARY SWELOT SUD 5V
MOMENTARY SWELOT SUD 5V
HEAD PHONES OUT (80) 120mW

● 10 W ● 569(W) × 309(D) × 249(H) mm ● 7.7kg

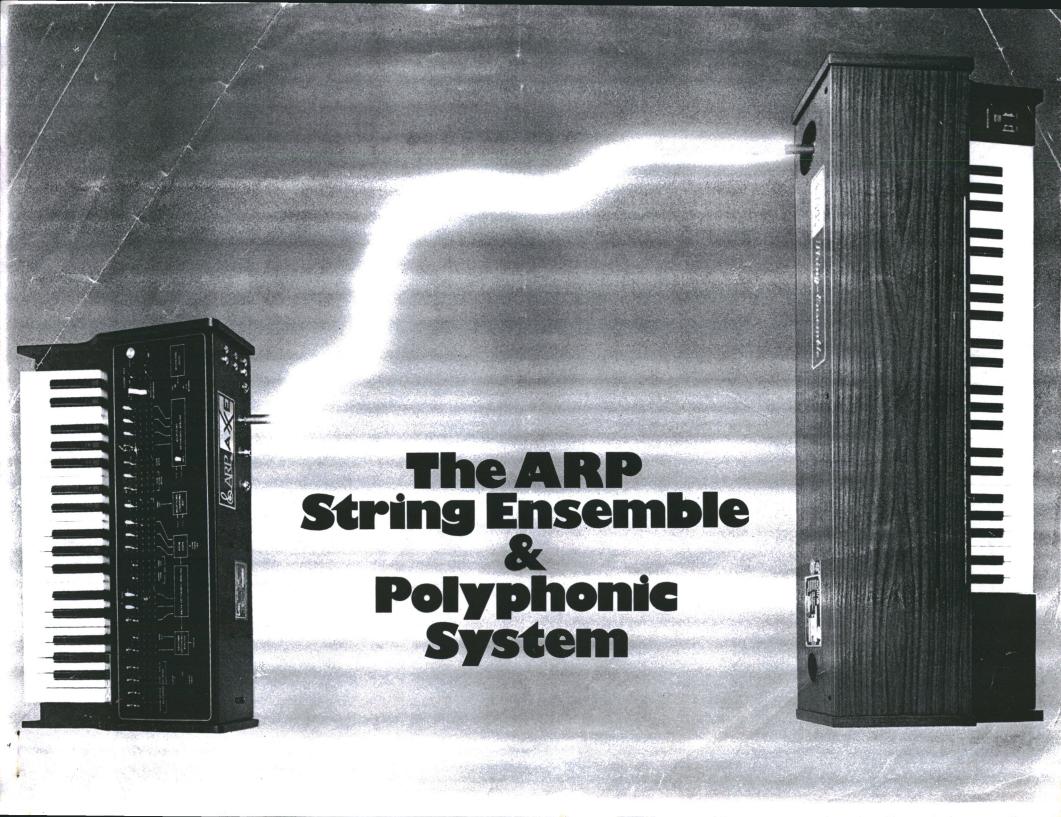
● CONNECTING CORD 3m · 1 PATCH CORD 35cm+;



Plug a guitar, microphone, or other signal into the external signal processor and use the MS-20 as a guitar synthesizer, vocal synthesizer, and soon.

Specifications subject to change without notice

5V - 5V



Mscmble

STRING ENSEMBLE

The ARP String Ensemble is a fully polyphonic synthesizer designed primarily to create the effect of an entire string orchestra.

Preset stops select violins, violas, cellos, or contrabass strings, individually or in any combination. A front panel "pitch control" knob allows the String Ensemble to be tuned sharp or flat. Slide controls to adjust the attack and sustain times allow the musician to create the most realistic string sounds.

The cellos and contrabass are played only in the lowest octave and a half on the keyboard. It is therefore possible to

play violin with the right hand and cello or contrabass with the left hand. A separate volume control for the bass section permits perfect balance of sound. An expression footpedal is included with each unit

In addition to the string sound, two horn stops are also provided which simulate trumpet and French horn choruses.

A "Modulation" switch defeats the internal phase shifters. This switch is usually used in conjunction with the polyphonic system.

Outputs are provided on the back panel for connection to any kind of guitar amplifier, P.A., organ, etc.

"System Interface" jacks on the rear panel allow the String Ensemble to be connected with an ARP AXXE, Odyssey, or 2600 to create the Polyphonic Synthesizer System.

CONTROLS:

Crescendo (attack time)

Sustain (release time)

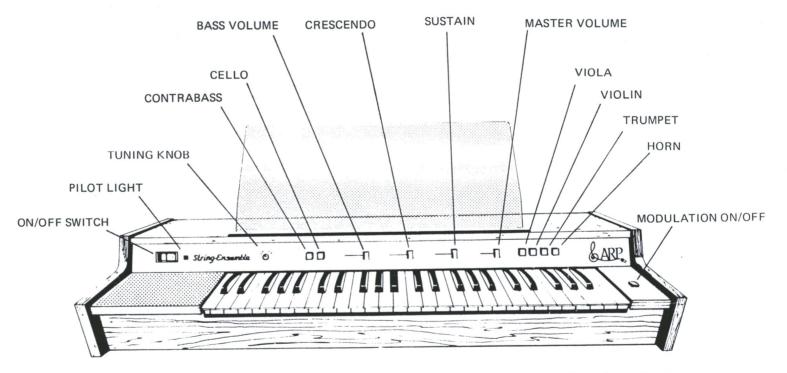
Bass and Cello Volume

Master Volume

Registration Select Push Buttons

On/Off Power Switch

Modulation On/Off



THE ARP STRING ENSEMBLE



Are You A Slave To Your Machines?



Free Yourself With The Human CLOCK



If you've ever tried playing live with a sequencer or a drum machine, you know what it's like to be a slave to your machines. The rigid tempo just doesn't feel right. Or, if you've ever tried adding sequenced material to a prerecorded track then you know what it's like to be the prisoner of your computer.

Free yourself with the HUMAN CLOCK™.

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The HUMAN CLOCK takes rhythmic pulse output

from your drummer, bass player, rhythm guitarist or keyboardist and through an exclusive Kahler® process called REAL TIME PREDICTION™, calculates live tempo and converts it to a midi-clock output that moves and changes with your tempol Instantly and naturally.

The HUMAN CLOCK lets you make music the way YOU want to, not the way your machines force you to.

Experience the freedom at your Kahler® dealer. The HUMAN CLOCK™

AN AMERICAN INVENTION BY™

for Studio Kahler

APM P.O. Box 9305 Anahiem, CA 92802

CLOCK SUNDING SMACE FEEL LEVEL MALE RESEARCH RES

I have I new Kahler Human Clocks for 200:

Studio & Stage Applications. The most obvious use of the HC is to brighten live performances by "humanizing" any sequencers or drum machines that are part of your set. Make sure the trigger signal is clean, though, or songs could run away from you unexpectedly. We found far more significance in its possible studio uses. For one, the HC can lock in on a properly equalized rhythm track and provide syncing for tapes that have damaged sync tracks or none at all. Our experiments with this were quite encour-

aging, after we perfected the three-handed knack of prepping the sequencers and drum machines, cuing the tape, and pressing the HC's reset button.

One more studio tip: With the right sync interface, you might lay down tape timecode using the HC as a master driver, creating sync tracks with a built-in "human feel." (You might also drive the HC with a drum machine, as we did in tests, and deliberately create sync tracks with highly artificial—but musically interesting—changes.)

Human Clock

Description: Intelligent trigger-to-MIDI-clock converter.

Interfacing: Two trigger ins, MIDI out. Footswitch operation of reset switch.

Features: Percussive or sustained input. Responsiveness adjustable in several ways.

Price: \$650.00.

Contact: American Precision Metal Works, 2725 Gretta Lane, Anaheim, CA 92806. (714) 632-5280.



WHY WOULD ANYONE BUILD ANOTHER MONO-SYNTH?

Because it's about time that you stopped putting up with nasally filters, single oscillators, and stripped-down electronics when you buy a low-cost monophonic synthesizer. To put things back in perspective, SCI introduces the Pro-One, a synthesizer that delivers the quality sound and features you want, not just a cheap approximation.

To start with, the Pro-One has the same electronics as its big brothers, the infamous Prophet-5 and the Prophet-10. You get the same sounds with no compromises (front panel looks familiar, neh?). Add pitch and mod wheels, extensive modulation capabilities, a C-to-shining-C 3 octave keyboard, single and multiple triggering modes, repeat and drone switches, and an audio out that can drive stereo headphones.

Enough? Hardly. A built-in digital sequencer with 2 sequences and up to 40 notes storage between them. An arpeggiator (that can be latched) for up or up/down arpeggios. Complete interfacing facilities including standard 1V/octave CV in/out, gate in/out (also used for external clock on the sequencer and arpeggiator), an audio input with pre-amp for using microphones, guitars, other keyboards, etc. A special gate generator that automatically obtains gates from the external signal, which can then trigger envelopes, advance the sequencer, etc. A unique

"automatic" glide mode that allows selective glide between notes. Also, there is an internal digital interface something that opens up a new realm in synthesizer/computer connections — especially with home computers.

We could keep going, but you must check out the Pro-One for yourself. Listen to the sound, look at the capabilities. No Compromises!

You're probably wondering how much this is going to cost. Would you believe \$645.00? Neither do our competitors.

The Pro-One from SCI.



We've done it again.